

vedic mathematics

The Secret of High-speed mental computations



Vedic Vision

“There are things which seem incredible to most men who have not studied mathematics.” – Archimedes.

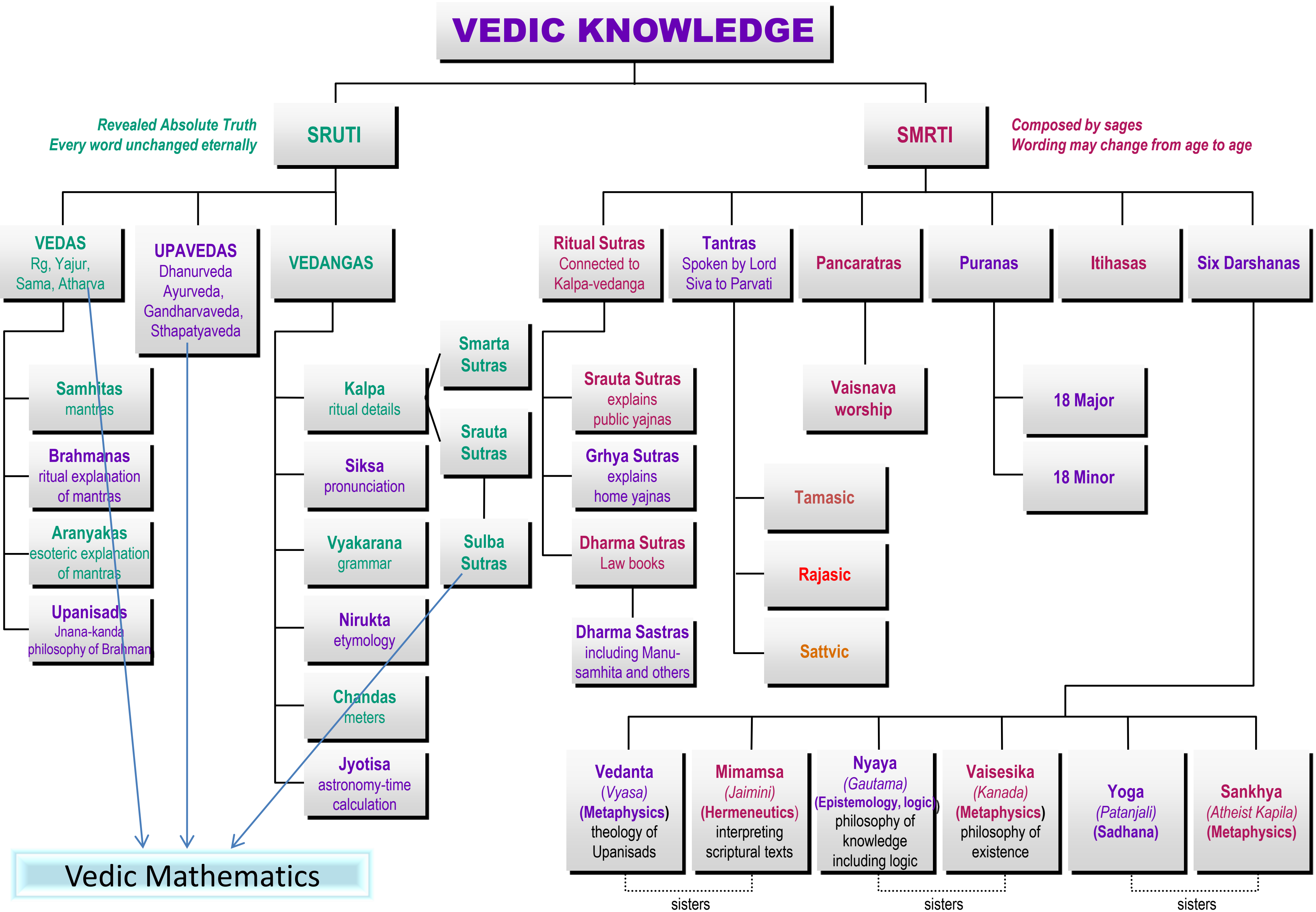
“Spiritually advanced cultures were not ignorant of the principles of mathematics, but they saw no necessity to explore those principles beyond that which was helpful in the advancement of God realization.”
– Vedic Mathematics and the Spiritual Dimension.

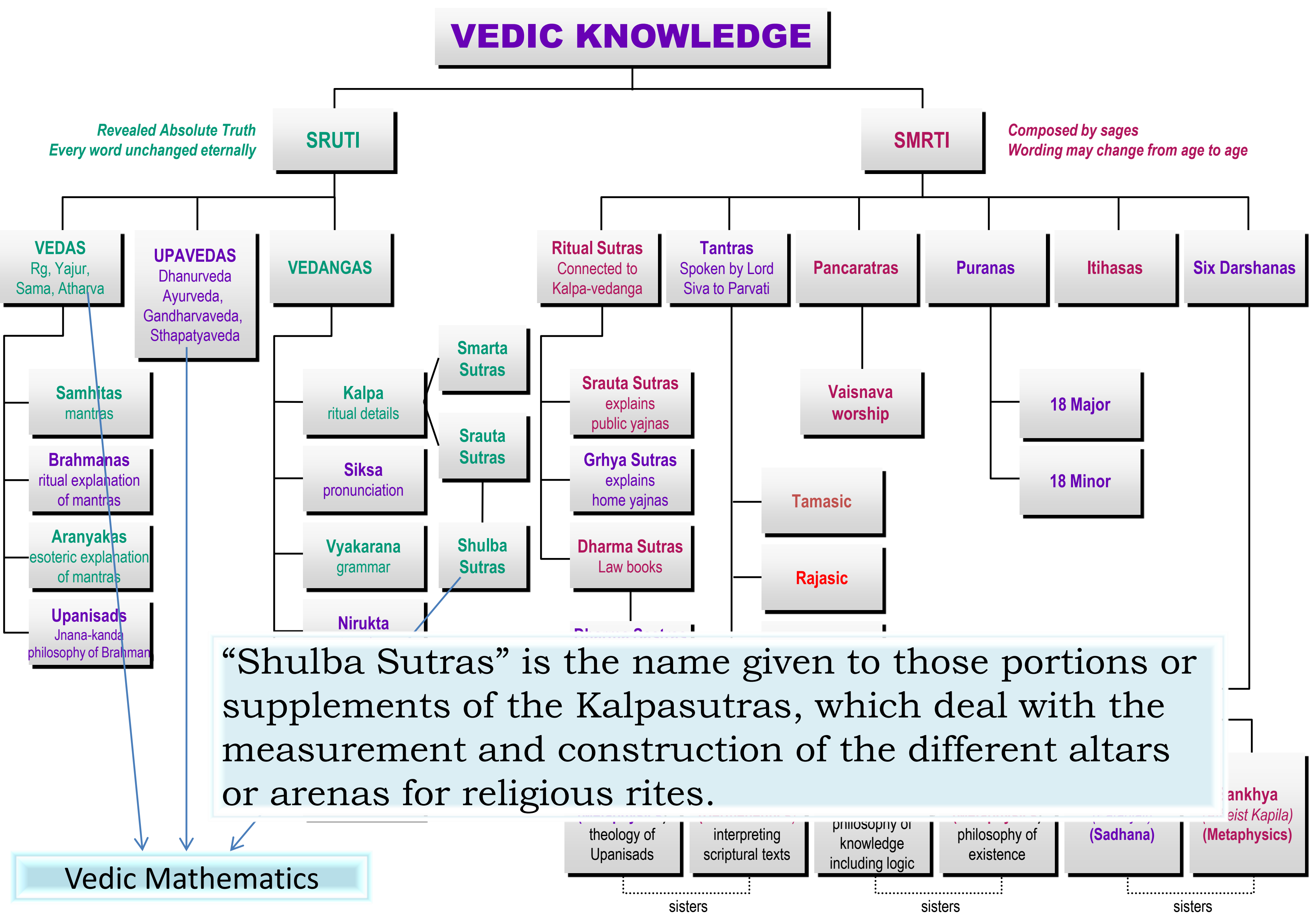
4 frailties

- We have imperfect senses. — Karana-patava
- We fall into illusion. — pramada
- We make mistakes. — bhrama
- We have cheating propensities. — vipralipsa

Descending Vedic knowledge → Perfect

[CC Adi 2.86, CC Adi 7.107]


VEDIC KNOWLEDGE
SRUTI
Revealed Absolute Truth
Every word unchanged eternally
SMRTI
Composed by sages
Wording may change from age to age
VEDAS
Rg, Yajur, Sama, Atharva
UPAVEDAS
Dhanurveda Ayurveda, Gandharvaveda, Sthapatyaveda
VEDANGAS
Samhitas
mantras
Brahmanas
ritual explanation of mantras
Aranyakas
esoteric explanation of mantras
Upanisads
Jnana-kanda
philosophy of Brahman
Kalpa
ritual details
Siksa
pronunciation
Vyakarana
grammar
Nirukta
etymology
Chandas
meters
Jyotisa
astronomy-time calculation
Smarta Sutras
Srauta Sutras
Sulba Sutras
Vedic Mathematics
Ritual Sutras
Connected to Kalpa-vedanga
Tantras
Spoken by Lord Siva to Parvati
Pancaratras
Puranas
Itihasas
Six Darshanas
Srauta Sutras
explains public yajnas
Grhya Sutras
explains home yajnas
Dharma Sutras
Law books
Dharma Sastras
including Manu-samhita and others
Vaisnava worship
Tamasic
Rajasic
Sattvic
18 Major
18 Minor
Vedanta
(Vyasa)
(Metaphysics)
theology of Upanisads
Mimamsa
(Jaimini)
(Hermeneutics)
interpreting scriptural texts
Nyaya
(Gautama)
(Epistemology, logic)
philosophy of knowledge including logic
Vaisesika
(Kanada)
(Metaphysics)
philosophy of existence
Yoga
(Patanjali)
(Sadhana)
Sankhya
(Atheist Kapila)
(Metaphysics)
sisters
sisters
sisters



"Shulba Sutras" is the name given to those portions or supplements of the Kalpasutras, which deal with the measurement and construction of the different altars or arenas for religious rites.

In order to help the pupil to memorize the material studied and assimilated, they made it a general rule of practice to write even the most technical and abstruse textbooks in sutras or in verse (which is so much easier-even for the children-to memorize). And this is why we find not only theological, philosophical, medical, astronomical, and other such treatises, but even huge dictionaries in Sanskrit verse! So from this standpoint, they used verse, sutras and codes for lightening the burden and facilitating the work (by versifying scientific and even mathematical material in a readily assimilatable form)!

Ref. *"Vedic Mathematics" by Bharati Krishna Tirtha Maharaja*

ka, ta, pa, and ya all denote 1;
kha, tha, pha, and ra all represent 2;
ga, da, ba, and la all stand for 3;
Gha, dha, bha, and va all represent 4;
gna, na, ma, and sa all represent 5;
ca, ta, and sa all stand for 6;
cha, tha, and sa all denote 7;
ja, da, and ha all represent 8;
jha and dha stand for 9; and
ka means zero.

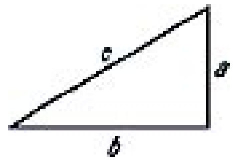
gopi bhagya madhuvrata
srngiso dadhi sandhiga
khala jivita khatava
gala hala rasandara

Translation: Lord anointed with the yogurt of the milkmaids' worship (Krishna), O savior of the fallen, master of Shiva, please protect me.

π = 3.1415926535897932384626433832792

The diagonal chord of the rectangle makes both the squares that the horizontal and vertical sides make separately.

— Sulba Sutra



$$a^2 + b^2 = c^2$$

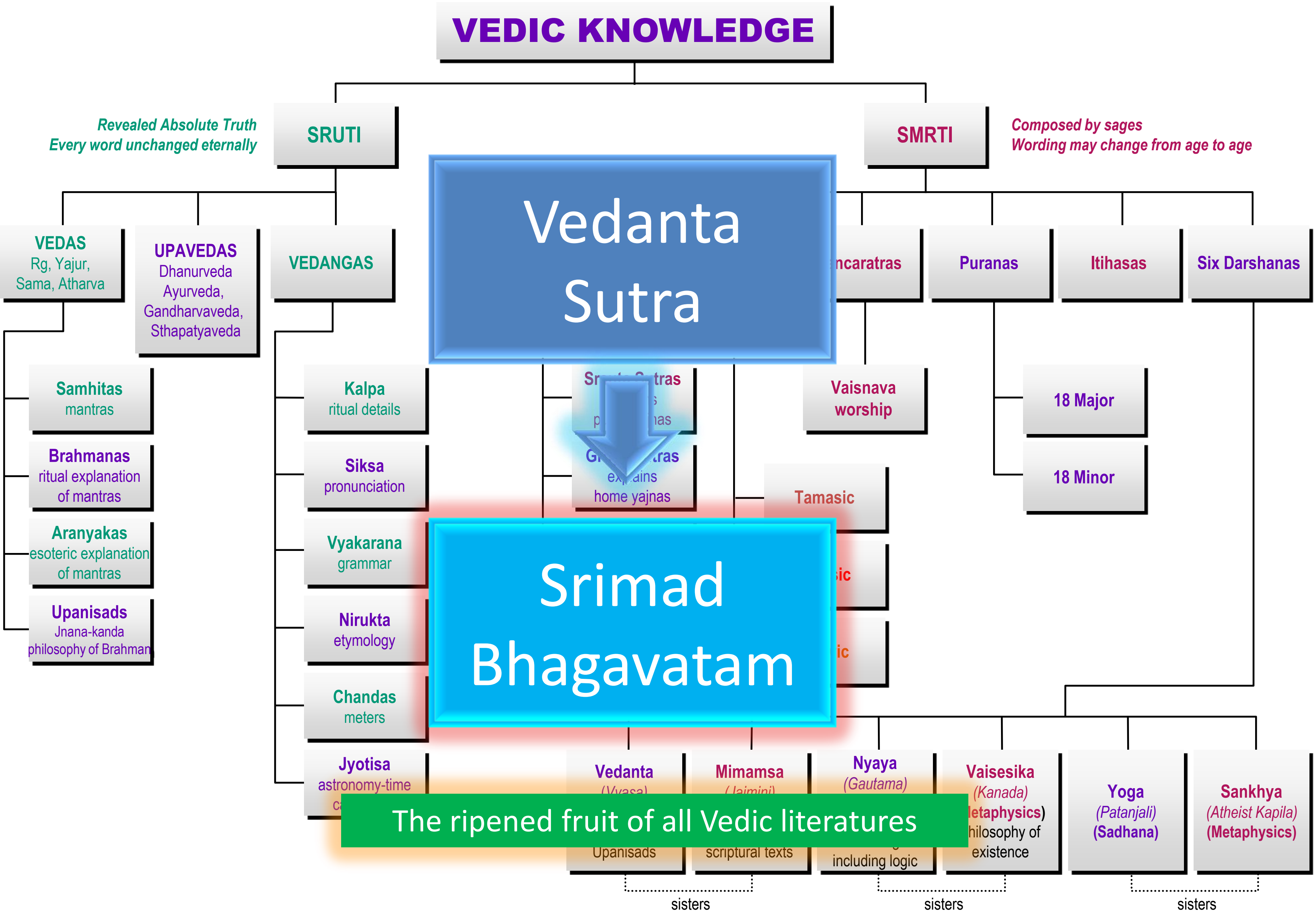
The square of the hypotenuse of a right angle triangle is equal to the sum of the squares of the other two sides.

— Pythagorean Theorem

(6th century B.C.)

Spiritually advanced cultures were not ignorant of the principles of mathematics, but they saw no necessity to explore those principles beyond that which was helpful in the advancement of God realization. Intoxicated by the gross power inherent in mathematical principles, later civilizations, succumbing to the all-inviting arms of illusion, employed these principles and further explored them in an attempt to conquer nature. The folly of this, as demonstrated in modern society today, points to the fact that "wisdom" is more than the exercise of intelligence. Modern man's worship of intelligence blinds him from the obvious: the superiority of love over reason.

Ref. *"Vedic Mathematics and the Spiritual Dimension" by B.B. Visnu Swami*



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(Sadhana)
Sankhya
(Atheist Kapila)
(Metaphysics)
The ripened fruit of all Vedic literatures
sisters
sisters
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Warm-up

Pick a number.

Double the number.

Add 10.

Divide by 2.

Subtract original number.

Write down a 3-digit number where digits are in decreasing order.

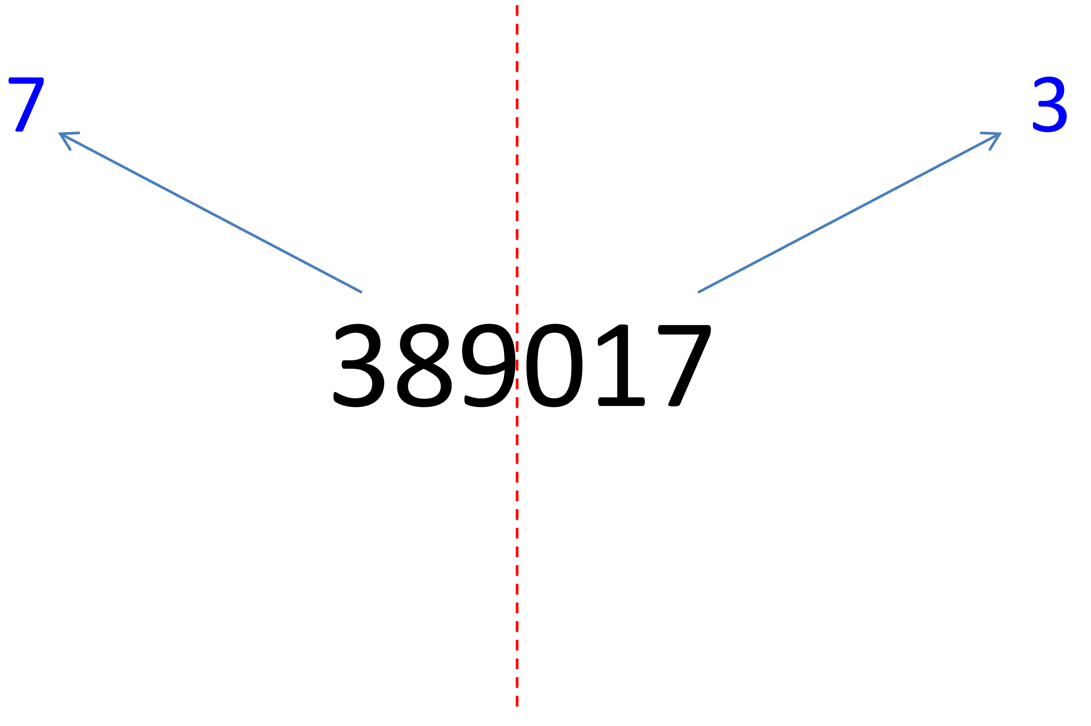
Reverse the digits and subtract it from the first number.

Reverse the digits of the result and add it to the result.

Cubic roots

Digit	Cube
1	1
2	8
3	27
4	64
5	125
6	216
7	343
8	512
9	729
10	1000

Digit	Cube	Last digit
1	1	1
2	8	8
3	27	7
4	64	4
5	125	5
6	216	6
7	343	3
8	512	2
9	729	9
10	1000	0


7
3
389017

Exercises

175616

238328

704969

103823

970299

39304

10648

Where did Vedas come from?

Squares, etc.

	4	5
x	4	5
	20	25

	4	2
x	4	8
	20	16

How does it work?

$$(10a + b)(10a + c)$$

$$= 100a(a + 1) + bc$$

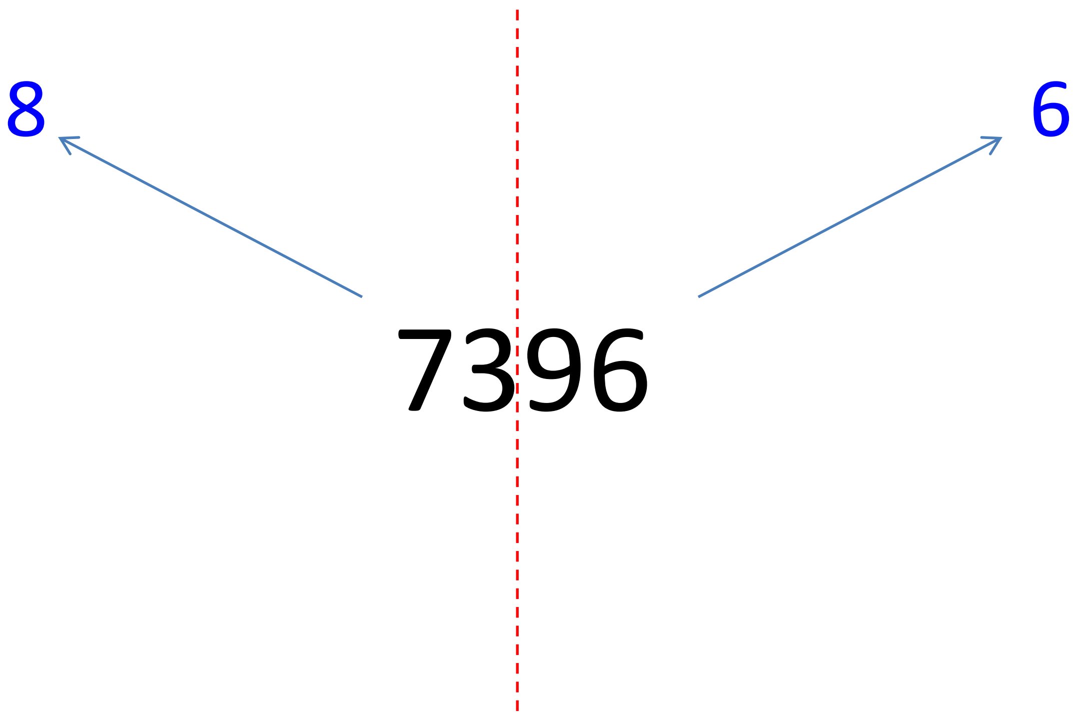
Exercises

Set 4 in the handout.

What’s the goal of Vedas?

Square roots

Digit	Square	Last digit
1	1	1
2	4	4
3	9	9
4	16	6
5	25	5
6	36	6
7	49	9
8	64	4
9	81	1
10	100	0



$> 85^2$

Exercises

784

2809

1296

4761

1849

5041

8649

What're the two kinds of approaches enjoined in the Vedas?





Multiplication techniques

nikhilam navatas caramam dasatah

“All from 9, the last from 10”

All from 9, the last from 10

4	2	3	5	7	2	7

5	7	6	4	2	7	3

	9	2	-		8
x	9	6	-		4
	8	8		3	2

How does it work?

$$(x \pm a)\ (x \pm b)$$

$$= x(x \pm a \pm b) \pm ab$$

All from 9, the last from 10

	1	0	2	+		2
X		9	6	-		4
		9	8	-1	$\bar{0}$	$\bar{8}$
		9	7		9	2

Exercises

Set 1 in the handout.

anurupyena

“Proportionately”

Proportionately

Base = 60 = 6 X 10

		6	3	+	3
X		4	5	-	15
6 X		4	8	$\bar{4}$	$\bar{5}$
	2	8	8	-5	5
	2	8	3		5

Proportionately

Base = 40 = 4 X 10

		6	3	+	23
X		4	5	+	5
4 X		6	8	11	5
	2	7	2	+11	5
	2	8	3		5

Proportionately

Base = 50 = 5 X 10

		6	3	+	13
X		4	5	-	5
5 X		5	8	$\bar{6}$	$\bar{5}$
	2	9	0	-7	5
	2	8	3		5

Proportionately

Base = 50 = 100/2

	6	3	+	1	3
X	4	5	-		5
2)	5	8		$\bar{6}$	$\bar{5}$
	2	9	-1	3	5
	2	8		3	5

Exercises

Set 2 in the handout.

Yavadunam tavadunikrtya varga ca yojayet

“Whatever the extent of its deficit or surplus, subtract or add still further to that extent respectively”

Surplus and Deficit squares

Base = 100

	9	2	-		8
x	9	2	-		8
	8	4		6	4

Surplus and Deficit + Proportionately

Base = 30 = 10 X 3

	2	9	-	1
X	2	9	-	1
3X	2	8		1
	8	4		1

How does it work?

a^2

$= (a + b)(a - b) + b^2$

Exercises

Set 3 in the handout.

Why are there seeming contradictions across different approaches to spirituality?





Urdhva tiryagbhyam

"vertically and cross-wise"

Vertically and cross-wise

	7	8	5		
x	3	6	2		
	21	6	7	6	0
	6	7	4	1	
	28	4	1	7	0

Need second row when computing left to right

Vinculum can be used to ease the process

Multiplying by all 9's

112 X 99

1	1	2		
+1	-	2	1	2
1	1	0	8	8

Exercises

Set 5 and 6 in the handout.

Thank you very much!